

### REMARKS

Claims 1-47 are pending in the application. Claims 43 and 45 have been canceled without prejudice. New claims 48-51 are hereby submitted. A fee for two additional total claims and five additional independent claims is enclosed to the present amendment.

#### Amendments to the claims

Claims 18 and 36 have been rewritten in independent form. Claim 21 has been amended to further recite that *"addressing wires associated with a first different subset are same as the addressing wires associated with a second different subset."* Claim 41 has been amended to recite *"axially doping a first set of nanoscale wires; aligning the first set of nanoscale wires"* and *"axially doping a second set of nanoscale wires; aligning the second set of nanoscale wires."* Claims 43 and 45 have been canceled. New claims 48-51, reflecting the language of claims 23-25 prior to the amendments to claim 21, have been added. No new matter has been added.

#### Claims 1-17, 19 and 20

In the Action (page 3), the Examiner rejects claim 1 under 35 USC § 102(b) as being anticipated by Kuekes (U.S. Pat. No. 6,256,767). The Applicants respectfully disagree.

Claim 1 recites *"controllable regions axially distributed along the nanoscale wires."* According to the Examiner, "controllable regions [are] generally defined as 36 in Fig. 6 or 36' or 38 or 40 in Fig. 8 of Kuekes." However, boxes 36 in Figure 6 of Kuekes define a junction between a nanoscale wire and a microscale wire, not *"controllable regions" of the nanoscale wire* (emphasis added). In other words, while in Kuekes control of a nanoscale wire operates by means of junctions formed or not formed between a nanoscale wire and a microscale wire, in claim 1 *"controllable regions axially distributed along the nanoscale wires"* are provided.

Further, Claim 1 recites that *"a first set of the controllable regions exhibit[. . .] a first physical property, and a second set of the controllable regions exhibit[. . .] a second physical property, different from the first physical property."* To the contrary, in Kuekes (Figure 6, for example) all junctions are the same.

Therefore, Applicants respectfully submit that claim 1 is novel over Kuekes, together with claims 2-17, 19 and 20 which directly depend on claim 1.

Additionally, claims 4 and 5 recite features which further distinguish those claims from Kuekes.

In claim 4, *"the difference between the first physical property and the second physical property is based on different doping levels of the controllable regions."* In the Action, page 7, the Examiner states that also Kuekes discloses different doping levels in the last two paragraphs of column 8. However, the Applicant has already pointed out with reference to claim 1 above the differences between claim 1 and Kuekes as to the *"controllable regions axially distributed along the nanoscale wires."* Additionally, the last two paragraphs of column 8 in Kuekes recite *"radial"* doping and not *"different doping levels of the [axially distributed] controllable regions."* In particular, in column 8 lines 49- 55 of Kuekes, doping of the coatings 20, 22 is disclosed. From Figure 1B in Kuekes (where the coatings 20, 22 are shown), it can be seen that doping in Kuekes occurs along the radius of the nanoscale wires.

In claim 5, *"the difference between the first physical property and the second physical property is based on different materials of the controllable regions."* In the Action, page 7, the Examiner states that the above feature is shown by reference numerals 36, 36', 38 or 40 in Kuekes. However, as already pointed out above, those numerals show junctions between a nanoscale wire and a microscale wire, not controllable regions of a nanoscale wire.

Therefore, Applicants submit that the Examiner is not in a position to assert that Kuekes anticipates claim 4 or 5.

**Claims 21 and 22**

In the Action (page 4), the Examiner rejects claim 21 under 35 USC § 102(b) as being anticipated by Kuekes. Applicants have amended claim 21 to recite that *"the addressing wires associated with a first different subset are the same as the addressing wires associated with a second different subset."* Support for this feature can be found, for example, in Figure 13 and related portions of the specification. In sharp contrast, Figure 10 in Kuekes shows, for each set of N molecular wires 40, different microscale wires 34'.

Therefore, Applicants submit that claim 21 is novel over Kuekes, together with claim 22, by virtue of its dependency on claim 21.

**Claims 26-35**

In the Action (page 5), the Examiner rejects claim 26 under 35 USC § 102(b) as being anticipated by Kuekes. Claim 26 recites "a second set of microscale wires intersecting the nanoscale wires, intersections between the second set of microscale wires and the nanoscale wires defining memory locations." Although the entire specification and drawings in Kuekes appear to only show memory locations formed between nanoscale wires and nanoscale wires, the Examiner is apparently taking the position that the language of claim 11 ("both of said two wires have a thickness that ranges from sub-micrometer to micrometer") anticipates claim 26.

Applicants respectfully but strongly disagree with the Examiner's interpretation. Throughout the entire specification, Kuekes uses the term "nanometer-scale switches," i.e. switches between nanoscale wires and nanoscale wires (Abstract line 2, Figure 1A, Figure 1B, column 6 line 18, column 8 lines 19-28 etc.). Therefore, there is no enablement in Kuekes for memory-location defining switches which could be made in a different way. Further, claim 11 in Kuekes depends on claim 1, which recites "nanometer-scale switches." As a consequence, the Applicants submit that the Examiner's argument that claim 11 in Kuekes anticipates claim 26 is without support.

Therefore, Applicants submit that claim 26 is novel over Kuekes, together with claims 27-35, by virtue of their dependence on claim 26.

In addition to being dependent on claim 26, claim 28 recites features which further distinguish such claim from Kuekes.

In the Action, page 5, the Examiner states that the nanoscale wires 14 in Figure 6 of Kuekes comprise controllable regions. Applicants respectfully disagree and submit, as also noted above, that Kuekes discloses junctions between nanoscale wires and microscale wires, differently from the *"controllable regions axially distributed along the nanoscale wires"* of claims 26 (on which claim 28 depends) and 28. Additionally, claim 28 recites that *"the nanoscale wires comprise controllable regions axially distributed along the nanoscale wires, a first set of the controllable regions exhibiting a first physical property, and a second set of the controllable regions exhibiting a second physical property, different from the first physical property."* As already explained with reference to claim 1, in Kuekes all junctions are the same.

#### **Claims 37-40**

In the Action (page 6), the Examiner rejects claim 37 based on Kuekes' Figures 6, 8 and 10, in conjunction with claim 16 in Kuekes. Applicants respectfully disagree with the Examiner's reading of the reference.

Claim 37 of the present application recites a *"three-dimensional memory array."* To the contrary, Figures 6, 8 and 10 in Kuekes show two-dimensional memory arrays and claim 16 in Kuekes expressly recites a *"two-dimensional memory array."*

Further, claim 37 of the present application recites that *"the nanoscale wires comprise controllable regions axially distributed along the nanoscale wires."* Applicants have already addressed this issue above and already explained why this feature is not anticipated by Kuekes.

Still further, claim 37 recites that *"a first set of the controllable regions exhibit[...] a first physical property, and a second set of the controllable regions exhibit[...] a second physical*

*property, different from the first physical property.*" These limitations have also already been addressed by Applicants in the present response.

Therefore, Applicants submit that claim 37 is novel over Kuekes, together with claims 38-40, which directly depend on claim 37.

**Claims 41, 42, 44, 46 and 47**

In the Action (page 6), the Examiner rejects claim 41 based on Figure 6 and claim 16 in Kuekes. Applicants have amended claim 41 to recite "*axially doping a first set of nanoscale wires*" and "*axially doping a second set of nanoscale wires.*" Applicants have shown above, with reference to claims 1 and 4 that, differently from what is recited in the claim, Kuekes discloses radial doping. Further, claim 41 recites "*aligning the . . . nanoscale wires [and] transferring the . . . aligned nanoscale wires.*" To the contrary, Kuekes' Figures only show 'snapshots' of an operative structure, without showing how the structure has been obtained. Therefore, Kuekes does not anticipate claim 41 as amended.

Further, Applicants note that the language of amended claim 41 is similar to the language of claim 43, now cancelled, and that the Examiner rejects claim 43 (page 9 of the Action) under 35 USC § 103(a) based on a combination between Kuekes and U.S. Pat. App. No. 2003/0089899 to Lieber (Lieber), with reference, in particular, to paragraph [0507] of Lieber. However, in view of Applicants' arguments above where further differences between Kuekes and amended claim 41 have been established, Applicants submit that the Examiner cannot make a prima facie § 103(a) rejection against claim 41 based on Kuekes and Lieber.

Therefore, Applicants submit that amended claim 41 is patentable over Kuekes and Lieber, together with claims 42, 44, 46, and 47, by virtue of their dependence on claim 41.

**Allowable subject matter**

In the Action, the Examiner objects to claims 18, 23-25 and 36 and states that those claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants agree with the Examiner that claims 18, 23-25 and 36 contain allowable subject matter. Claim 18 has been rewritten in independent form. Claims equivalent to claims 23-25 as objected by the Examiner have been rewritten as claims 48-51 and are believed to be allowable. However, Applicants have retained claims 23-25 in view of the above discussion with respect to claim 21. Finally, claim 36 has been rewritten in independent form.

**IDS**

An Information Disclosure Statement (IDS) for the present application is being filed concurrently with the present response under separate cover.

\* \* \*

Applicants submit that all claims of the application as amended herein are in condition for allowance. Prompt issuance of a Notice of Allowance is earnestly solicited.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450 on

September 15, 2004  
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Susan Papp  
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Susan Papp  
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Enclosures:

- Petition for excess claims fee
- Excess claim Check for excess claims in the sum of \$ 233.00
- Postcard